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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,043	02/14/2002	Gregory M. Chrysler	2207/12666	7585

23838 7590 06/27/2003

KENYON & KENYON
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WASHINGTON, DC 20005

EXAMINER

LAVILLA, MICHAEL E

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 06/27/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
10/074,043

Applicant(s)
CHRYSLER ET AL.

Examiner
LA VILLA

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above, claim(s) 1-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-17, drawn to a method of making a diamond heat spreader, classified in class 204, subclass 192.15+.
 - II. Claims 18-30, drawn to a diamond heat spreader article, classified in class 428, subclass 408.
2. The inventions are distinct, each from the other because of the following reasons:
3. Inventions of Group I and of Group II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by a process that entails providing a covering layer, as desired, and growing a diamond heat spreader body on said covering layer to obtain the desired final article.
4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

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5. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.
6. During a telephone conversation with Ms. Jalali on 12 June 2003 a provisional election was made with traverse to prosecute the invention of Group II, claims 18-30. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-17 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.
7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:
9. The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
10. Claims 18-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
 - I. Regarding Claims 18 and 19, it is unclear what is meant by the term "predetermined." To the extent that this means "determined

beforehand," it is indefinite. See Joseph E. Seagram & Sons, Inc. v. Marzall, Comr. Pats., 84 USPQ 180 (Court of Appeals, District of Columbia). It is unclear how the "predetermined roughness" and "predetermined flatness" differ from "roughness" and "flatness," respectively.

- II. Regarding Claim 18, it is unclear whether the "thermal coupling surface" is necessarily a surface of a "covering layer." It is unclear whether a diamond layer could not exhibit roughness on both surfaces. What distinguishes "exhibiting roughness" from "possessing roughness"? If both surfaces "exhibit roughness," must there be present a covering layer on both surfaces? Is the cover layer to be one continuous layer if present on more than one surface of the diamond layer?
- III. Regarding Claim 19, it is unclear what is meant by the phrase "on the at least one surface defining at least one respective polished metal surface having the at least one predetermined roughness and predetermined flatness." It is unclear what is the relationship of the requirement of a "polished metal surface" to the phrases of "predetermined roughness" and "predetermined flatness." Is the word "of" missing in line three after the word "one"? Is the covering layer (or more than one covering layer) supposed to be a polished metal layer?

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It is unclear what is meant by "defining at least one respective polished metal layer." With respect to what is there a relationship?

- IV. Regarding Claim 20, it is unclear what is meant by the phrase "the final layer defining the at least one respective thermal coupling surface."

Claim 19 demands that the polished metal surface is that surface that has the predetermined roughness and/or flatness and Claim 18 demands that the covering layer has a thermal coupling surface with the predetermined roughness and/or flatness. That the final layer of Claim 20 should assume these attributes appears to be a contradiction. Is the final layer to be one continuous layer if present on more than one surface of the covering layer?

- V. Regarding Claim 22, it is unclear what is meant by the phrase "pre-selected regions." With respect to the term "pre-selected," this is indefinite to the extent that it means "determined beforehand." See Joseph E. Seagram & Sons, Inc. v. Marzall, Comr. Pats., 84 USPQ 180 (Court of Appeals, District of Columbia). It is unclear whether these regions made of different metals refer to the composition of the final layer or, possibly, to the composition of some other layer.

- VI. Regarding Claim 23, it is unclear whether the adhesion layer is to be one continuous layer if present on more than one surface.

- VII. Regarding Claim 24, it is unclear whether the barrier layer is to be one continuous layer if present on more than adhesion layer.

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- VIII. Regarding Claim 26, it is unclear what is meant by the phrase "connected thermally coupled to the heat sink."
- IX. Regarding Claim 29, it is unclear what is meant by the phrase "means adhered to at least one surface of the diamond layer for providing at least one respective thermal coupling surface of the heat spreader." It is unclear whether this is a means plus function claim. Is there a claimed function of providing a surface through which there may be thermal coupling to another body? Is this a function or a structure? It is unclear whether a single means is to be adhered to more than one surface. Would two be required?
- X. Regarding Claim 30, it is unclear whether "the means" demands a covering layer on two surfaces.

11. Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

13. A person shall be entitled to a patent unless –

14. (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
15. (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

16. Claims 18-21, 23, 24, 25, 29, and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Petkie USP 6,531,226. Petkie teaches coating a diamond

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substrate with an adhesive layer, barrier layer, and gold layer, wherein the various layers necessarily possess a certain roughness. See Petkie (Abstract; col. 3, line 43 through col. 4, line 46; Examples 1 and 2; col. 7, line 65 through col. 8, line 16; and Claims).

17. Claims 18-23, 25, 29, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Thorpe et al. USP 5,804,321. Thorpe et al. teaches coating a diamond substrate with an intermediate layer, a solder layer, and a heat sink, wherein the various layers necessarily possess a certain roughness. Claim 22 may be considered to be taught by the chromium content of a nichrome braze. See Thorpe et al. (Abstract; Figure 1; col. 2, lines 31-56; col. 4, lines 21-38; Examples 1 and 2; and Claims).

18. Claims 18, 19, 25, 29, and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Hall et al. USPA 2002/0023733. Hall et al. teaches a diamond substrate having a bondable layer that bonds to a heat sink and integrated circuit die. See Hall et al. (Abstract; Figures 1 and 5; paragraphs 9, 15-17, 22, 28, 31, 32, 36; and Claims).

19. Claims 18-21, 23, 25, 29, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Shiomi et al. USP 5,976,909. Shiomi et al. teaches a diamond heat spreader coated with insulating diamond, metal alloy, and gold alloy, wherein a heat source is bonded to the gold alloy layer, wherein the various layers necessarily possess a certain roughness. See Shiomi et al. (Abstract; Figures 1, 3-5, 7, and 8; col. 2, line 40 through col. 3, line 8; col. 3, lines 55-64;

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col. 4, lines 5-24; col. 10, lines 36-45; and col. 11, line 37 through col. 13, line 11). A metal polished layer would inherently be indistinguishable from the metal layers of Shiomi et al. in view of the absence of any particular degree of claimed metal polishing.

20. Claims 18-21 and 23-30 are rejected under 35 U.S.C. 102(e) as being anticipated by C Chrysler et al. USPA 2002/0074649. Chrysler et al. teaches using a diamond heat spreader with covering layers, intermediate layers, and buffer layers made of metal, including outer gold containing layers. The heat spreader is used in OLGA applications. The various layers necessarily possess a certain roughness. See Chrysler et al. (Abstract; Figures 3-6; and paragraphs 45, 55, 59-62, 64, 66, 70-74).

21. Claims 18-21 and 23-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Mahajan et al. USPA 2002/0105071. Mahajan et al. teaches using a diamond heat spreader with covering layers, intermediate layers, and buffer layers made of metal, including outer gold containing layers. The heat spreader is used in OLGA applications. The various layers necessarily possess a certain roughness. See Mahajan et al. (Abstract; Figures 3-6; and paragraphs 94, 95, 102-3, 116-8, and 128-33).

22. The last two applied references have a common inventor with the instant application. Based upon the earlier effective U.S. filing dates of the references, they constitute prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any

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invention disclosed but not claimed in the references was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

CONCLUSION

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael La Villa whose telephone number is (703) 308-4428. The examiner can normally be reached on Monday through Friday.
24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.
25. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Michael La Villa
June 16, 2003

